

U.S. Department of Energy  
Office of River Protection  
Mr. Michael K. Barrett  
Contracting Officer  
P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

CCN: 024492

Dear Mr. Barrett:

**CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL FOR APPROVAL –  
AUTHORIZATION BASIS CHANGE NOTICE 24590-WTP-ABCN-ESH-01-013,  
REVISION 0, *CODES AND STANDARDS UPDATE/NPH DESIGN REQUIREMENTS***

Bechtel National, Inc. (BNI) is submitting the attached Authorization Basis Change Notice (ABCN), 24590-WTP-ABCN-ESH-01-013, Revision 0, to the U.S. Department of Energy (DOE), Office of River Protection (ORP), and the Office of Safety Regulation (OSR) for approval. This ABCN requests approval to (1) revise Safety Requirements Document (SRD) Safety Criteria (SC) 4.1-3 and 4.1-4 to change the Performance Category (PC)-3 categorization for Safety Design Class and Safety Design Significant controls that have a Natural Phenomenon Hazard function for chemical hazards to PC-2, and (2) revise the implementing standards citation in SC 4.1-2, 4.1-3, and 4.1-4 and Section 2.0 of Appendix C of the SRD Volume II.

The basis of the change is alignment of the designation of PC for the River Protection Project-Waste Treatment Plant (WTP) facility with the commercial industry with respect to chemical hazards. The non-nuclear, chemical industry utilize design standards that are embodied in the Uniform Building Code. The corresponding Uniform Building Code requirements are implemented in the WTP design through the designation of PC-2. Additional changes have been made to standards referenced in SC 4.1, which are updates to the current version of the standards. One standard was added to SC 4.1-3, which reflects the current industry requirements for design of masonry structures.

The changes requested in this ABCN are consistent with the contents of the forthcoming Partial Construction Authorization Request (PCAR) submittal and are necessary to align the PCAR with the existing authorization basis. Approval is requested by December 14, 2001, to support issuance of engineering design calculations and design drawings.

This change does not affect documents issued to support limited construction activities. The design requirements and standards embodied in this change are not required for evaluation of underground piping and foundation drawings issued to support excavation for the basemats.

These changes have been discussed with Mr. Lew Miller of the OSR.





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ABCN Title Codes & Standards Update / NPH Design Requirements

## C. ABCN Approval

WTP Project Manager R Naventi  
Print/Type Name Signature Date

## II. Description of the Proposed Change to the Authorization Basis

D. Affected AB Documents:

Title	Document Number	Revision
Safety Requirements Document, Volume II	24590-WTP-SRD-ESH-01-001-02	0a

Decision to Deviate ☐ Yes ☒ No

If yes, DTD Number \_\_\_\_\_ Deficiency Report Number \_\_\_\_\_  
Initiating Document Number \_\_\_\_\_ Revision \_\_\_\_\_

E. Describe the proposed changes to the Authorization Basis Documents:

### NPH Design Requirements

Revise the NPH design requirements in SRD 4.1-3 for SSC's designated SDC/SDS solely on the basis of chemical consequence from PC-3 to PC-2.

### Codes & Standards

Revise the citation of the following previously approved implementing standards as identified in safety criteria 4.1-2, 4.1-3 and 4.1-4 and section 2.0 of Appendix C of the SRD:

1. ACI 349-97 and ACI 349R-97 to ACI 349-01 and ACI 349R-01 respectively, with tailoring for seismic proportioning and detailing.  
(Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary)
2. ACI 530-95 to ACI 530-99.  
(Building Code Requirements for Masonry Structures)
3. ASCE 4-98 (Draft) to ASCE 4-98.  
(Seismic Analysis of Safety-Related Nuclear Structures and Commentary)
4. IEEE Std 344-1987 to IEEE Std 344-1987(R1993).  
(Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations)

Add ACI 530-99 to list of implementing standards in section 4.1-3

F. List associated ABCNs and AB documents, if any:

No other ABCNs for this change.



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G. Explain why the change is needed:

## NPH Design Requirements

The basis for the change is to align the designation of Performance Category (PC) for the RPP-WTP facility with that of the commercial industry with respect to chemical hazards. Currently the SRD (Section 4.1-3) requires an SSC designated either SDC or SDS, based solely on a safety function relative to chemical hazard, to meet PC-3 design requirements. The non-nuclear, chemical industry, utilize design standards embodied in the Uniform Building Code. The Uniform Building Code is implemented into the RPP-WTP design through the designation of PC-2.

This change is needed to allow the LAW facility to be designed and constructed commensurate with the potential hazards associated with the facility and not "over design" the facility to meet codes and standards intended for facilities with large radioactive inventories.

## Codes & Standards

The basis for the change to the standards listed above is that the new standards reflect the most current design information from the industry for seismic and other natural phenomena hazards.

1. ACI 349-01 reflects the most current methodology endorsed by the American Concrete Institute for concrete structures subject to seismic loading. ACI 349-01 also contains the latest methodology for the design of anchor bolts, in addition to updates to the previous version of the code. Seismic proportioning and detailing will be in accordance with ACI 318-99 Chapter 21 in lieu of ACI 349-01 Chapter 21, this being the most current detailing methodology.
2. ACI 530-99 reflects the most current methodology endorsed by the American Concrete Institute for masonry design. Seismic proportioning and detailing pertaining to Seismic Performance Category 'D' will be adopted.
3. ASCE 4-98 reflects the most current methodology endorsed by the American Society of Civil Engineers for the Seismic Analysis of Safety-Related Nuclear Structures. ASCE 4-98 now replaces the 'Draft' version previously available.
4. IEEE Std 344-1987(R1993) reflects the most current methodology endorsed by the Institute of Electrical & Electronic Engineers. IEEE Std 344-1987(R1993) is the most recent publishes 're-approval' of the 1987 code.

The addition of ACI 530-99 to section 4.1-3 is to cover masonry design in a Seismic Category I/II facility.  
(Note: ACI 530 already exists as referenced in Safety Criteria 4.1-2 and 4.1-4 of the SRD)

H. List the implementation activities and the projected completion dates:

### Activity

### Date

Inform DOE that AB has been revised

30 days after  
DOE  
approval

Distribute revised pages

14 days after  
DOE  
approval

Provide updated electronic version of AB to DOE

30 days after  
DOE  
approval



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H. List the implementation activities and the projected completion dates:

<u>Activity</u>	<u>Date</u>
Revise the following implementing documents:	
<u>Documents</u>	<u>Describe extent of revisions</u>
1 n/a	
2 n/a	
<u>Describe other activities:</u>	<u>Date</u>
1 Ensure updated standards are reflected in appropriate design media and associated DIMs.	Next revision of applicable documents
2 n/a	

## III. Evaluation of the Proposed Change

I. Is DOE prior approval required?

- 1 Does the revision involve the deletion or modification of a standard previously identified or established in the SRD? Yes ☒ No ☐

Explain

Modifications to previously identified standard are described in Section G above.

- 2 Does the revision result in the reduction in commitment currently described in the AB? Yes ☒ No ☐

Explain

### NPH Design Requirements

Changing the NPH design requirements for SSCs that are solely for control of chemical hazards from PC-3 to PC-2 is a reduction in commitment. PC-3 design requirements are more stringent than PC-2 design requirements.

### Codes and Standards

The revisions to previously identified implementing codes and standards in the SRD reflect the most current design information from the industry for seismic and other natural phenomena hazards. The changes to the codes and standards will result in the application of more conservative design requirements. The requested code and standards changes do not reflect a reduction in commitment currently described in the AB.

- 3 Does the revision result in a reduction in the effectiveness of any procedure, program, plan, or management process described in the AB? Yes ☐ No ☒

Explain

This change is not associated with any procedure, program, plan, or management process.



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J. Complete the safety evaluation by describing how the revision to the AB:

- 1 will continue to comply with all applicable laws and regulations, conform to top-level safety standards, and provide adequate safety

No specific laws or Federal regulations are associated with the selection of alternative standards for the SRD.

The top-level safety standards applicable to the proposed changes to the SRD are those cited as regulatory bases in the various Safety Criteria proposed for revision. The following provides the title or subject of each top-level safety standard so cited, and a brief discussion showing that conformance to the standard is maintained.

#### **4.1-3 & 4.1-4**

*DOE/RL-96-0006 4.2.2.2 Proven Engineering Practices/Margins-Common-Mode/Common-Cause Failure*

Substitution of the UBC seismic requirements for SSCs designed against chemical hazards is consistent with proven engineering practice, as evidenced by the discussion in the preceding sections of this evaluation. Similarly, the code and standard revisions are also consistent with proven engineering practice.

#### **4.1-2**

*DOE/RL-96-0006 4.1.2.4 Safety Responsibility-Operating Experience and Safety Research*

*DOE/RL-96-0006 4.1.5.1 Configuration Management-Formal Configuration Management*

*DOE/RL-96-0006 4.1.6.2 Quality Assurance-Established Techniques and Procedures*

*DOE/RL-96-0006 4.2.2.1 Proven Engineering Practices/Margins-Proven Engineering Practices*

*DOE/RL-96-0006 4.2.2.3 Proven Engineering Practices/Margins-Safety System Design and Qualification*

*DOE/RL-96-0006 4.2.5.1 Inherent/Passive Safety Characteristics-Safety Margin Enhancement*

The proposed code changes are more conservative as evidenced in the previous discussion and maintain conformance to the cited top level safety standards.

Revision of the NPH design requirements specified in SC's 4.1-3 and 4.1-4 is proposed to make the design of the WTP, with respect to chemical hazards, consistent with commercial industry practice. PC-3 requirements are intended to provide design requirements for SSCs needed to protect workers and the public from hazards not normally encountered in the chemical industry. These are the radiological hazards unique to (in this case) a nuclear waste processing plant. The chemical industry has proven NPH design requirements for SSCs needed to protect workers and the public from chemical hazards, many of which far exceed the chemical hazards at the WTP. These design requirements are contained in the Uniform Building Code. The UBC forms the basis for PC-2. By revising the NPH design criteria in the SRD, the WTP is more consistent with commercial chemical industry practice, will not "over-design" the facility, and will continue to provide adequate safety to workers and the public.

- 2 will continue to conform to the original submittal requirements associated with the AB documents being revised

These changes do alter the content or format of the SRD in a manner that results in non conformance with the original submittal requirements, namely the actual SRD and the associated safety evaluation report (RL/REG-98-20, *DOE Regulatory Unit Evaluation of BNFL Inc. Safety Requirements Document*).



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- 3 will not result in inconsistencies with other commitments and descriptions contained in the AB or an authorization agreement

Changes to standards in the SRD do not result in inconsistencies with other commitments in the AB since standard identification is unique to the SRD. The Limited Construction Authorization Request (LCAR) and the Limited Construction Authorization Agreement do not discuss standards specifically, but reference the SRD as a basis for approval of the authorization agreement.

## K. Justification of the Proposed Change

### NPH Design Requirements

The designation of Performance Category 3 is intended to address significantly larger hazards encountered at the RPP-WTP facility than there are in the non-nuclear industry (ie., the large radioactive material inventories). This standard was not intended to be applied to chemical hazards at WTP. The chemical hazards routinely encountered in the RPP-WTP facility are significantly smaller, both in quantity and toxicity, than those present in chemical industry facilities. These non-nuclear industries have developed NPH design requirements to deal with the associated chemical hazards. These requirements are embodied in the Uniform Building Code, which is implemented at the WTP facilities as Performance Category 2.

This revision is consistent with industry practice for chemical hazards.

### Codes and Standards

The revisions to previously identified implementing codes and standards in the SRD reflect the most current design information from the industry for seismic and other natural phenomena hazards.

## L. Certification of Continued SRD Adequacy

Based on evaluations from III.I.1 and III.J.1. If question III.I.1 is marked "yes, Project Manager certification is required. The Project Manager's signature certifies that the revised SRD continues to identify a set of standards that provide adequate safety, complies with WTP applicable laws and regulations, and conforms with top-level safety standards and principles. This certification is based on adherence to the DOE/RL-96-0004 standards identification process and successful completion of review and confirmation by the PSC.

WTP Project Manager: Ron Naventi

Print/Type Name

Signature

Date

## M. List of Attachments

1. Copies of the affected AB document(s) or appropriate excerpt(s) showing the proposed revision(s).

<p style="text-align: center;"><b>River Protection Project - Waste Treatment Plant</b> <b>Safety Requirements Document Volume II</b> <b>24590-WTP-ABCN-ESH-01-013-02, Rev 0, Attachment 1, Page 1 of 7</b></p>
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#### 4.0 Engineering and Design

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Safety technologies incorporated into the facility design should have been proven by experience or testing and should be reflected in approved codes and standards. Significant new design features should be introduced only after thorough research and model or prototype testing at the component, system, or facility level, as appropriate, to achieve the necessary level of confidence that the design feature will perform as expected.

#### Implementing Codes and Standards

ACI 318-99 Building Code Requirements for Structural Concrete  
ACI 318R-99 Commentary on Building Code Requirements for Structural Concrete  
ACI 349-9701 Code Requirements for Nuclear Safety-Related Concrete Structures  
ACI 349R-9701 Commentary on Code Requirements for Nuclear Safety-Related Concrete Structures  
AISC MO16-89 Manual for Steel Construction - Allowable Stress Design, Ninth Edition  
ANSI/AISC N690-94 Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities  
ASCE 4-98 (Draft) Seismic Analysis of Safety-Related Nuclear Structures and Commentary  
ASCE 7-95 Minimum Design Loads for Buildings and Other Structures  
DOE-STD 1020-94 (Change 1, 1996) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities  
1997 UBC Uniform Building Code  
DOE Newsletter (Interim Advisory on Straight Winds and Tornados) Dated 1/22/98  
ACI 530-95, Building Code Requirements for Masonry Structures and Commentary  
24590-WTP-SRD-ESH-01-001-02, Appendix A, Implementing Standard for Safety Standards and Requirements Identification  
ISO 10007 Quality Management - Guidelines for Configuration Management  
ASTM D3740, Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction  
ASTM D2922, Standard Test Method for Laboratory Determination of Moisture Content of Soil  
ASTM D3017, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods

#### Regulatory Basis

DOE/RL-96-0006	4.1.2.4	Safety Responsibility-Operating Experience and Safety Research
DOE/RL-96-0006	4.1.5.1	Configuration Management-Formal Configuration Management
DOE/RL-96-0006	4.1.6.2	Quality Assurance-Established Techniques and Procedures
DOE/RL-96-0006	4.2.2.1	Proven Engineering Practices/Margins-Proven Engineering Practices
DOE/RL-96-0006	4.2.2.3	Proven Engineering Practices/Margins-Safety System Design and Qualification
DOE/RL-96-0006	4.2.5.1	Inherent/Passive Safety Characteristics-Safety Margin Enhancement

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#### Safety Criterion: 4.1 - 3

This criterion addresses natural phenomena hazards (NPH) design for structures, systems, and components (SSCs) that are Important to Safety and have NPH safety functions.

SSCs designated as Important to Safety (i.e., Safety Design Class and Safety Design Significant) shall be designed to withstand the effects of NPH events such as earthquakes, wind, and floods without loss of capability to perform specified safety functions required as the result of the NPH events. This includes both the front line and support systems that must function for a NPH event such that the public, collocated worker, or facility worker exposure standards of Safety Criterion 2.0-1 or 2.0-2 are not exceeded.



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SSCs that are designated Safety Design Class (excepting those so designated based solely on chemical hazards) and that are required to perform a safety function as a result of a given NPH shall be designed to withstand the NPH loadings of that NPH as provided in Table 4-1. These SSCs are designated Seismic Category I (SC-I) for earthquakes and Performance Category 3 (PC-3) for other NPH. ~~SSCs designated as Safety Design Class based solely on a safety function relative to chemical hazards shall be designated as SC III for earthquakes, and shall be designed to meet PC 3 requirements for other NPH events.~~

SSCs that are designated Safety Design Significant (excepting those so designated based solely on chemical hazards) whose continued function is not required for an NPH event, but whose failure as a result of an NPH event could reduce the functioning of a Safety Design Class SSC such that exposure standards might be exceeded, shall be designed to withstand the NPH loadings of that NPH as provided in Table 4-1. For these SSCs, however, for seismic response only, credit may be taken for inelastic energy absorption per Table 2-4 of DOE-STD-1020-94. These SSCs are designated SC-II for earthquakes and PC-3 for other NPH. ~~SSCs designated as Safety Design Significant based solely on a safety function relative to chemical hazards shall be designated as SC III for earthquakes, and shall be designed to meet PC 3 requirements for other NPH events.~~

~~For any SSC included under this criterion, other NPH loads (for which the SSC has no safety function) may be taken from Safety Criterion 4.1 4 and Table 4 2 in lieu of Safety Criterion 4.1 3 and Table 4 1. SSCs designated as Safety Design Significant based solely on safeguarding a safety function relative to chemical hazards shall be designated SC III for earthquakes, and shall be designed to meet PC 2 requirements for other NPH events.~~

**Table 4-1. Natural Phenomena Design Loads for Important to Safety SSCs with NPH Safety Functions**

Hazard	Load	Source Document for Load
Seismic	DBE with 0.26 g horizontal PGA and 0.18 g vertical PGA See Figures 4-1 and 4-2	WHC-SD-W236A-TI-002 <sup>a</sup> DOE-STD-1020-94 <sup>b</sup>
Straight wind	111 mi/hr , 3-second gust, at 33 ft above ground, Importance factor, I=1.0	DOE Newsletter <sup>c</sup>
Wind Missile	2x4 timber plank, 15 lb at 50 mi/hr (horiz), Max height 30 ft	DOE-STD-1020-94 <sup>b</sup>
Tornado and Tornado Missiles	Not Applicable	DOE-STD-1020-94 <sup>b</sup>
Volcanic ash	12.5 lb/ft <sup>2</sup>	HNF-SD-GN-ER-501 <sup>d</sup>
Flooding	Dry site for river flooding Local precipitation: 4 in. for 6 hours	HNF-SD-GN-ER-501 <sup>d</sup>
Snow	15.0 lb/ft <sup>2</sup> snow load	HNF-SD-GN-ER-501 <sup>d</sup>

<sup>a</sup> Geomatrix, 1996, *Probabilistic Seismic Hazard Analysis DOE Hanford Site, Washington*, WHC-SD-W236A-TI-002, Rev.1A, prepared for Westinghouse Hanford Company, Richland, Washington.

<sup>b</sup> DOE STD-1020-94, (1996, Change 1) *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*, U.S. Department of Energy, Washington, D.C., 1996.

<sup>c</sup> DOE Newsletter (Interim Advisory on Straight Winds and Tornadoes) Dated 1/22/98.

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<sup>d</sup> HNF-SD-GN-ER-501, Rev. 1, “Natural Phenomena Hazards, Hanford Site, South-Central Washington”, Westinghouse Hanford Company.

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4.0 Engineering and Design

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**Implementing Codes and Standards**

ACI 349-~~01~~<sup>97</sup> Code Requirements for Nuclear Safety-Related Concrete Structures  
ACI 349R-~~01~~<sup>97</sup> Commentary on Code Requirements for Nuclear Safety-Related Concrete Structures  
[ACI 530-99 Building Code Requirements for Masonry Structures and Commentary](#)  
ANSI/AISC N690-94 Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities  
ASCE 4-98 (~~Draft~~) Seismic Analysis of Safety-Related Nuclear Structures and Commentary  
ASCE 7-95 Minimum Design Loads for Buildings and Other Structures  
DOE-STD 1020-94 (Change 1, 1996) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities  
IEEE 344-1987 ([R1993](#)) Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations  
1997 UBC Uniform Building Code  
DOE Newsletter (Interim Advisory on Straight Winds and Tornados) Dated 1/22/98  
24590-WTP-SRD-ESH-01-001-02, Appendix A, Implementing Standard for Safety Standards and Requirements Identification

**Regulatory Basis**

DOE/RL-96-0006      4.2.2.2    *Proven Engineering Practices/Margins-Common-Mode/Common-Cause Failure*

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**Safety Criterion:      4.1 - 4**

This criterion addresses natural phenomena hazards (NPH) design for structures, systems, and components (SSCs) without NPH safety functions.

SSCs that may be important to the safety of the RPP-WTP shall be designed to withstand the effects of NPH such as earthquakes, wind, and floods. The SSCs included under this criterion are:

1. SSCs Important to Safety (either Safety Design Class or Safety Design Significant) that do not have an NPH safety function,
2. SSCs that are not Important to Safety and that have significant inventories of radioactive or hazardous materials but in amounts less than quantities that might lead to an Important to Safety designation, and
3. SSCs that are important to safety because of their function to protect workers and members of the public from exposure to chemical hazards.

These SSCs are designated Seismic Category III (SC-III) for earthquakes and Performance Category 2 (PC-2) for other NPH.

SSCs included under this criterion shall be designed to withstand the NPH loadings as provided in Table 4-2.

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**Table 4-2. Natural Phenomena Design Loads for SSCs without NPH Safety Functions**

Hazard	Load	Source Document for Load
Seismic	Uniform Building Code <sup>a</sup> , Static Force Procedure	DOE-STD-1020-94 <sup>b</sup>
Straight wind	91 mi/hr 3-second gust, at 33 ft above ground, Importance factor, I=1.00	DOE Newsletter <sup>c</sup>
Wind Missile	Not Applicable	DOE-STD-1020-94 <sup>b</sup>
Tornado and Tornado Missiles	Not Applicable	DOE-STD-1020-94 <sup>b</sup>
Volcanic ash	5 lb/ft <sup>2</sup>	HNF-SD-GN-ER-501 <sup>d</sup>
Flooding	Dry site for river flooding Local Precipitation: 2.5 in. for 6 hours	HNF-SD-GN-ER-501 <sup>d</sup>
Snow	15.0 lb/ft <sup>2</sup> snow load	HNF-SD-GN-ER-501 <sup>d</sup>

<sup>a</sup> 1997, *Uniform Building Code*, International Conference of Building Officials, Whittier, California.

<sup>b</sup> DOE STD-1020-94, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*, U.S. Department of Energy, Washington, D.C., Change 1, 1996.

<sup>c</sup> DOE Newsletter (Interim Advisory on Straight Winds and Tornadoes) Dated 1/22/98

<sup>d</sup> HNF-SD-GN-ER-501, Rev. 1, "Natural Phenomena Hazards, Hanford Site, South-Central Washington", Westinghouse Hanford Company

### Implementing Codes and Standards

ACI 318-99 Building Code Requirements for Structural Concrete

ACI 318R-99 Commentary on Building Code Requirements for Structural Concrete

AISC MO16-89 Manual for Steel Construction - Allowable Stress Design, Ninth Edition

ASCE 7-95 Minimum Design Loads for Buildings and Other Structures

DOE-STD 1020-94 (Change 1, 1996) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

1997 UBC Uniform Building Code

ACI 530-9~~5~~<sup>5</sup> Building Code Requirements for Masonry Structures and Commentary

DOE Newsletter (Interim Advisory on Straight Winds and Tornadoes) Dated 1/22/98

24590-WTP-SRD-ESH-01-001-02, Appendix A, Implementing Standard for Safety Standards and Requirements Identification

### Regulatory Basis

DOE/RL-96-0006

4.2.2.2 Proven Engineering Practices/Margins-Common-Mode/Common-Cause Failure

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4.0 Engineering and Design

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**Safety Criterion: 4.1 - 5**

Structures, systems, and components designated as Safety Design Class shall be appropriately protected against dynamic effects (e.g., the effects of missiles, pipe whipping, and discharging fluids) that may result from failures of moderate and high energy systems or other accident conditions.

In consideration of the need to protect structures, systems, and components which are designated as Safety Design Class from these dynamic effects, the failure of the moderate or high energy system need not be postulated to occur simultaneously with an accident unless the events are causally related.

**Implementing Codes and Standards**

ACI 349-~~01~~<sup>97</sup> Code Requirements for Nuclear Safety-Related Concrete Structures

ACI 349R-~~01~~<sup>97</sup> Commentary on Code Requirements for Nuclear Safety-Related Concrete Structures

ANSI/AISC N690-94 Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities

ASCE 4-98 (~~Draft~~) Seismic Analysis of Safety-Related Nuclear Structures and Commentary

ASCE 7-95 Minimum Design Loads for Buildings and Other Structures

DOE-STD 1020-94 (Change 1, 1996) Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities

DOE Newsletter (Interim Advisory on Straight Winds and Tornados) Dated 1/22/98

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**Safety Criterion: 4.1 - 6**

Adequate provisions for facility security and physical protection of structures, systems, and components Important to Safety shall be provided.

**Implementing Codes and Standards**

PL-W375-MG0004, Safeguards and Security Program Plan

**Regulatory Basis**

DOE/RL-96-0006      4.3.6.1    Security-Security

## **X.0 ACI 349, Code Requirements for Nuclear Safety-Related Concrete Structures**

Revision: 2001

Sponsoring Organization: American Concrete Institute

### RPP-WTP Specific Tailoring

The following tailoring of ACI 349-01 is required for use by the RPP-WTP contractor as an Implementing Standard for structural design.

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#### **Chapter 21    Seismic Proportioning and Detailing**

Replace Chapter 21 of ACI 349-01 with Chapter 21 of ACI 318-99

**Justification:** Chapter 21 of ACI 349-01 is based on criteria from ACI 318-95. The American Concrete Institute completed a major revision of ACI 318 between the years 1995 and 1999 with respect to seismic proportioning and detailing. The RPP-WTP Project wishes to adopt the most current methodology as presented in ACI 318-99 in lieu of that presented in ACI 349-01 Chapter 21.